

## COMMENTARY

### LEARNING ABOUT OTHER SPECIES: AN UPDATED COMPONENT OF A LIBERAL ARTS EDUCATION

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Some aspects of a liberal arts education—critical thinking, respect for truth and clarity of expression—are unchanging in value. Knowledge of humans and human culture remains central. But if the goal of the curriculum is to prepare students for broad engagement in the world, an understanding of the Earth and all of life calls for equal time.

Humanity is, for now at least, bound to Earth. Here, unbridled growth of the human population and profligate use of natural resources threaten our own existence and put at risk the well-being and continuance of all life and the environment. An appreciation of the planet and preparation toward committed stewardship should be among the primary goals of education. Liberal arts education can not afford to be self-centered, in the sense of study of human culture outside its environmental context and without attention to the thousands of species that are our evolutionary associates.

We propose a course that guides students towards an appreciation of the Earth as home to many species. At the end of the essay, the course is integrated within an updated liberal arts curriculum.

**Learn to know other species.** Perhaps the most effective path toward an appreciation of life on Earth is through first-hand knowledge of species other than our own. The primary goal of the proposed course is to learn the identities of commonly encountered species. The course need not be heavily laden with deep academic underpinning—the value lies in learning to recognize species by sight, as they are encountered in everyday life, and to identify them by name.

A know-the-species course provides foundation for one of the most basic lessons in humility—humans are one species among hundreds of thousands. So many of us are hardly aware that others exist, except in an abstract way. Daily acquaintance with other species on a “first-name” basis greatly broadens one’s view of the natural world and engenders a closeness, a sense of unity, with it. Even if names of species eventually are forgotten, at least the memory remains that each is unique, distinguished by features that most have previously been unaware of.

One can quickly learn to identify a half-dozen species (hollies, oaks, maples, etc.) and to see that some of the species are more similar among themselves while others are more unique. Such an appreciation of variation and diversity, even in a simple system, is the quickest way possible toward real insight into the process of evolution—patterns of similarity among species result from common ancestry. Each species on Earth is the product of long evolutionary lineage, interrelated among the others, each unique and beautiful.

“I am strongly induced to believe that, as in music, the person who understands every note will, if he also possesses a proper taste, more thoroughly enjoy the whole, so he who examines each part of a fine view, may also thoroughly comprehend the full and combined effect. Hence, a traveller should be a botanist, for in all views plants form the chief embellishment.”—**Charles Darwin**, 1836, *Voyage of the Beagle*.

**Nature of the course.** Plants are the most conspicuous and abundant expression of non-human life, even in urban settings, and we believe they are the best focus for the proposed course. It’s joyful to walk along a



sidewalk, through a park, or through the woods and recognize species of oaks, elms, and maples by name. Even in a cityscape, dozens of species are commonly planted and usually many more are scrabbling out their existence, unassisted, seeding themselves in unlikely places.

Awareness of other species also could be gained from an introduction to birds, beetles, fish, or fungi, or practically any other kind of organism, but none of these is as easily accessible as plants. Do other courses in biology (e.g., physiology, genetics, molecular biology, cell biology) offer the same potential insights? Simply, no—most are based on study of a single species or of no species in particular. Some courses in ecology require a basic knowledge of species diversity, but the focus is different. Studies of geology, meteorology, and astronomy may be doorways to recognition of the diversity of everyday extra-human experience and could be analogous to identification of plants, but diversity, or at least every-day accessibility, is much lower.

Residents of the United States and other highly urbanized areas are so removed from other species that it is easy to be unaware that plants underpin our existence. Do undergraduates recognize that our diet is mostly of roots, stems, leaves, fruits, and seeds? Do typical students know that most of the energy expended by human individuals comes directly from starch in corn, rice, cassava, wheat, and potatoes? Beans, bananas, and sorghum are the world's dietary staples. Chocolate, coffee, sugar—the plant foods that tempt us. Cotton, flax, hemp, mulberry—the plants of fashion. Even the meat in our diet is but one step away from plant nutrition. Plants are responsible for nearly all our oxygen, our clothes (directly or indirectly), and most of our non-food energy (fossil fuels —oil, natural gas, coal). These topics deserve a place in a liberal arts education.

Since the suggested course is not an abstruse undertaking, basic knowledge of other species should be taught not only as part of a liberal arts collegiate education but in elementary through high school as well. Of course, this is one among many basic topics, but lack of knowledgeable teachers is a constraint and the responsibility usually comes to rest at college level.

**Suggested course outline.** (A) identification of 100 species, concentrating on first-hand recognition of those most easily at hand and abundant; (B) a brief overview of plant vegetative features and reproduction (flower and fruit structure usually are critical in identification) and common families encountered among the species; (C) perspectives on evolution, the interrelatedness of life, and global patterns of diversity; and (D) a brief introduction to ecological and economic values of plants encountered in everyday life (e.g., urban forests, invasive species, food, clothes, construction, fuel). Simply learning to know the species is the first priority.

**Goals of a liberal arts education.** In the broad view, we believe that a liberal arts curriculum should be aimed (1) toward continued existence of our own species and all others and (2) toward maximizing the potential for freedom and happiness (including creativity, appreciation of beauty, productivity, service, and increasing understanding of the world).

Overview of an updated liberal arts curriculum. We divide a suggested curriculum into four major, overlapping categories.

1. **The Earth and all things non-human.** Life and life processes (humans as animals, other species, ecology, evolution), geology, weather and climatology. Our proposed course would figure as a central focus in this category.
2. **Intellectual outlook.** Reasoning and critical thinking (including scientific method), respect for truth, clarity of expression, philosophy and ethics.
3. **Humans and human culture.** Beauty (visual art, music, perception), cultural diversity and history (history, language, philosophy, ethics, and religion).
4. **The Universe and universal principles.** Astronomy and cosmology, physics and chemistry, mathematics.